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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,779	09/16/2003	Hyung-Bok Choi	51876P368	4829

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BLAKELY SOKOLOFF TAYLOR & ZAFMAN  
12400 WILSHIRE BOULEVARD  
SEVENTH FLOOR  
LOS ANGELES, CA 90025-1030

EXAMINER

PHAM, HOAI V

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/664,779

Applicant(s)

CHOI, HYUNG-BOK

Examiner

Hoai v. Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 21 and 23-45 is/are pending in the application.
- 4a) Of the above claim(s) 23-24, 32-38, 40-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21, 25-31 and 39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Figs. 7-8F, claims 21, 23-31 and 37-39 in the reply filed on March 07, 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claim 23-24 and newly claims 37-38 withdrawn from consideration as being depended to a non-elected invention.

### ***Specification***

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 25-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25, lines 10-11, the limitation "forming a storage node hole by etching the storage node insulating layer and the storage node supporting layer to make an etching

process be stopped at the first etch barrier layer” renders the claim indefinite. It is not clear how the storage node insulating layer and the storage node supporting layer can be etched **to make** an etching process be stopped at the first etch barrier layer.

Claim 25, lines 15-16, the limitation “a bottom region of **the storage node**” renders the claim indefinite. It is not clear which elements **the storage node** refers to.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 21, 25-27, 30-31 and 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Park [U.S. Pat. 6,867,094].

With respect to claim 21, Park (figs. 2A-2F, cols. 4-6) discloses a method for fabricating a capacitor of a semiconductor device, comprising the steps of:

forming an inter-layer insulating layer (310) on a substrate (300);

forming a storage node contact (320) connected to the substrate by passing through the inter-layer insulating layer;

forming a storage node supporting layer on the inter-layer insulating layer in a manner that an insulating layer (335) is inserted into a space between a first etch barrier layer (330) and a second etch barrier layer (340);

forming a storage node oxide layer (345) on the second etch barrier layer (340);

forming a storage node hole (355) exposing the storage node contact by etching the first and the second etch barrier layers, the insulating layer, and the storage node oxide layer; and

forming a cylindrical storage node (360) electrically connected to the storage node contact.

With respect to claim 31, Park (fig. 2E) discloses removing selectively the storage node oxide layer (345).

With respect to claims 30 and 39, Park (fig. 2B) discloses that the hole (355) is having consistent vertical profiles. Thus, the storage node hole (355) is inherent carried out by employing a dry etching process.

With respect to claim 25, as best understood, Park (figs. 2A-2F, cols. 4-6) discloses a method for fabricating a capacitor of a semiconductor device, comprising the steps of:

forming an inter-layer insulating layer (310) on a substrate (300);

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forming a storage node contact (320) connected to the substrate by passing through the inter-layer insulating layer;

forming a storage node supporting layer on the inter-layer insulating layer in a manner that an insulating layer (335) is inserted into a space between a first etch barrier layer (330) and a second etch barrier layer (340);

forming a storage node insulating layer (345) on the storage node supporting layer;

forming a storage node hole (355) by etching the storage node insulating layer (345) and the storage node supporting layer, wherein the etching stopped at a bottom of the first barrier layer (330);

removing selectively the storage node insulating layer (345) and the storage node supporting layer to widen a width of the storage node hole (355) and simultaneously form an under-cut region in between the second etch barrier layer and the first etch barrier layer;

forming a cylindrical storage node (360) in the storage node hole (355) and into the under-cut region, wherein a bottom region of the cylindrical storage node (360) electrically connected to the storage node contact (320).

With respect to claim 26, Park (fig. 2C and col. 5, lines 1-13) discloses that at the step of widening the width of the storage node hole and forming the under-cut region in between the second etch barrier layer (340) and the first etch barrier layer (330), the

storage node insulating layer (345) and the storage node supporting layer are selectively etched through a dip process using a wet chemical.

With respect to claim 27, Park (col. 4, lines 13-64) discloses that the storage node insulating layer (345) and the insulation layer are oxide layers, and the first and the second etch barrier layers (330 and 340) are nitride layers.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park [U.S. Pat. 6,867,094].

Park discloses that the dip process uses diluted HF (col. 5, lines 1-40). Park does not explicitly disclose the temperature range as claimed by Applicant. However, the temperature range would have been obvious to an ordinary artisan practicing the invention because, absent evidence of disclosure of criticality for the range giving unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). Furthermore, the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is

aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

### ***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai v. Pham whose telephone number is 571-272-1715. The examiner can normally be reached on M-F.

11. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
HOAI PHAM  
PRIMARY EXAMINER